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ABSTRACT

In a rapidly changing world, schools need to reorient their curricula to ensure adequate preparation of children for the future. Among the fundamental changes affecting society are the diversification of lifestyles, the development of genetic engineering, trends toward automation, and the information explosion. The educational crisis reflects these changes. Torsten Husen notes the increase in schools' bureaucratization, sorting functions (which cause fierce competition), and socialization functions (which stifle needed student qualities). To survive the crisis, the school curriculum must assume three new orientations. First, the curriculum should have a futures orientation and should include studies of futurism, forecasting methods, and alternate futures. Second, the curriculum should have a systemic orientation. Current Western thought is too analytical. Education should instead start with the whole, not the parts, and should avoid linear or sequential approaches, stress the concepts of limits and interdependence, integrate disciplines and levels through a thematic approach, and emphasize understanding the relationships among facts. Finally, the curriculum should have a global orientation to prepare students for the future's heterogeneous "global village." Schools should reinstate foreign language study at all educational levels and should infuse curricula with comparative, cross-cultural perspectives. Following these three orientations will help produce the "competent generalists" needed in the next century. (Author/RW)

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SYSTEMIC AND GLOBAL LEARNING

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ABSTRACT

In a society heaving with change, the school cannot remain unaffected. The real crisis in the world of education today reflects the fundamental changes occuring in the broader societal context. Unless the school becomes part of the solution, it will fail miserably and remain part of the problem. This paper will explore three major curricular directions-Futures, Systemic and Global-the school must take if it hopes to fulfill its avowed mission: to prepare younger generations for life in the 21st century.

INTRODUCTION:
Fundamental Changes in Society

The 20th century is an age of great transitions. Society's traditional values have been eroded and replaced by a myriad of alternatives. Industrialization has changed society's most basic and vital unit: the family. The old agrarian extended family is on the road to extinction; the nuclear family, transient and mobile, is threatened as statistics on divorce indicate.

Futurist Robert Francoeur (1972) foresees the intensification of present trends towards diversity in lifestyles. Communes, extended families of one's choice, triangular relationships, corporate families, group marriages are but a few of the alternatives in human relationships. Established religions, especially in the Christian world, are fighting a losing battle trying to maintain the integrity of their dogmas while shepherding the dwindling numbers of their congregations who, disgruntled by what they perceive as unrealistic demands on such issues as contraception and abortion, or attracted by the glitter of newly established cults and more accommodating sytems of values, are leaving the church "en masse".

Paralleling these new configurations in relationships and those profound value changes, the tremendous revolutions in science and technology have opened new horizons for humanity. Research on aging, genetics and recombinant DNA coupled with advances such as microsurgery and chemotherapy foreshadow the day when humans can be in control of their own destiny.

Automation is radically changing the world of work as we know it. Daniel Bell, a Harvard sociologist, makes a comprehensive analysis of the future economic world in his book The Coming Post-Industrial Society (1976), and predicts the emergence of a new labor force. Today's business-oriented society, geared to the production of goods, will evolve into a society which produces services.

In a society where the pressure to keep up-to-date is constantly increasing, education cannot stop at high school or college. It has to become a life-long activity. Students today are preparing themselves for jobs which might no longer exist five or ten years from now or for jobs that might not yet exist. Unless the students are intellectually versatile and adaptive, they will not fare well in tomorrow's world.

Finally, we are witnessing the early stages of the information explosion. Its unprecendented proliferation in the last two decades parallels the development of today's computer society. As computers become increasingly indispensable in science, government and business, those educated in their use will have a tremendous advantage over the rest of the population. Computer illiteracy may well become a major handicap to those who will live in the 21st century.

Yet, crisis means danger as well as opportunity. Underlying some of the most exciting opportunities for humans are many

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disquieting trends. Environmental degradation, the increasingly voracious exploitation of natural resources, overpopulation, food shortages, energy scarcity, international unrest, the threat of nuclear warfare, terrorism, and the upsurge of crime, all show that the transition into the 21st century will be made at considerable costs.

More than ever do we need young people - our most important resource - who can confidently, innovatively and boldly create positive images of the future and translate their visions into policy and practice. It is imperative that we redesign an educational delivery system which fits into the context of changing social values, because the dangers for mankind are all too great.

THE SCHOOL IN QUESTION

As society experiences the traumas of change, the school in its midst cannot and has not remained unaffected. In his brilliant and remarkable analysis, The School in Question (1979), Torsten Husen examines the many problems which confront education today, at the global level. After a close examination of the raging criticisms directed at the schools everywhere in the last decade or so, and a careful assessment of the conflicting paradigms which have emerged, be they the Neo-Rousseauist, Neo-Marxist of the "back to the basics" movements, Husen masterfully synthesizes the focal points of the global educational malaise.

1) The school has evolved from the "little red school house" to a formidable institution which exhibits the characteristics of rigidity, inflexibility, coldness and detachment - the hallmarks of bureaucracies - but which are in essential conflict with its human and humane mission (1979:chp. 7).

2) The transformation from an elite to a mass system of education has changed radically the role of the school. Instead of becoming the hoped-for "Great Equalizer", it has become the "Great Sorting Machine" and the fierce competition for formal credentials has resulted in endless years of schooling during which students are more and more segregated from the world of work and society at large (1979:151).

3) Recent changes in social values and particularly the unprecedented influx of women into the work force have burdened the school with socializing functions which were previously the prerogative of the family. In Husen's own words, "the task of making young people psychologically and socially mature has to a large extent been turned over to the school-increasingly, the home tends to be closed down during the day" (1979:133). Yet the school is an institution which by essence is "information rich" but "action poor" (1979:133). Unfortunately, while it successfully imparts the verbal and cognitive skills necessary to function in an increasingly intellectual and technical society, the school fails to prepare students for life and even tends to stifle such qualities as initiative, cooperative ability, the ability to take responsibility..., so needed in the working world.

Professor Husen wisely concludes his study with a series of questions to ponder too aware of the fate awaiting precise policy recommendations:

> "Having worked with planners and policy-makers at both national and international levels, I am keenly aware of how meaningless it is to try to come up with sweeping recommendations compiled in the laundrylist fashion. Such recommendations are particularly useless if they are not consistently related to the diagnosis conducted and to each other. They are, if they are taken seriously, dangerous, since piecemeal and short-term panaceas tend to be attractive to politicians given the conditions of office under which they operate" (1979:180-81).

Yet, despite his cautious stance, Professor Husen's study contains some clear suggestions to help break down the factitious barriers which have been erected between the school and the world around it. He advocates for example, "a sandwiching of classroom instruction and part-time work in enterprises outside the school" (1979:158), and such programs as cooperative education, workstudy programs, practical vocational guidance..., have already been implemented in many school systems around the world. Yet, since Husen does not dwell into the issue of the curriculum, this author, will attempt to define some of the changes the school could make in its curriculum in order to prepare, more successfully, its students for the challenging prospects of the next century.

I. THE FUTURES ORIENTATION

As if unaware of a society in turmoil, the school blithely goes on teaching the skills and the values of the past. Our intention is not to denigrate the past-oriented curriculum which has proven its worth through the years. We live on what Waller has called "the heaped-up bones of uncounted generations of ancestors. It is only by virtue of those ancestors

and their achievements that we are where we are." (Waller, 1961:15) The study of Homo sapiens' evolution, his ideas, his beliefs, his artistic and literary creations, his political systems, is a sine qua non for a wise preparation for tomorrow. We have to know who we are, where we are and how we got there if we want to plan carefully the next step in human development.

Our intention is to present a feasible and desirable alternative which will offer to what George Wald calls "A Generation in Search of a Future" (1974), a formal curriculum which will truly offer them a past-present-future continuum. We have a past-oriented curriculum, we must now futurize it. In times of declining enrollment, tightening resources and rampant inflation the task will not be easy, but it is necessary. Cultural transmission is not enough, cultural modification is of the essence. If the school cannot become part of the solution, it will fail miserably and remain part of the problem, creating millions of candidates for future shock.

The ways to do this are many. Futurist H. F. Disbury proposes a core program which would give the student "the background to appreciate the futurist orientation, an awareness of its methodologies and their limitations, a series of alternative futures and the opportunity to futurize if they wish" (1975:196).

The six courses that he offers for considerations are:

1) Yesterday's Utopia, Today's Society (A survey of utopian thought in history)

2) Technological Civilization and Culture (A study of the unique characteristics of industrial and post-industrial society)

3) Methodologies of Futurism (A survey of various methods or techniques used in the study of the future)

4) Technological Forecasting and Technological Assessment (A study of technological innovations and the probable impacts on life and society)

5) Alternative Futures (An examination of a variety of scenarios or "Future Histories")

6) Seminar on Futurism (A transdisciplinary discussion of topics of special interest or problems of methodology) (1975:197).

Disbury's model is one concrete illustration of a way to introduce the study of the future into the curriculum, especially at the high school level where there is need for students to receive a solid foundation. Other core courses could be designed along the same lines with slight modifications depending on the particular school and its avowed mission, the expertise of its faculty and the extent of its facilities (e.g. AV, computers...). However, a new program must avoid what Disbury calls "snares and traps," those lapses into routine and convention and eventual extinction. We must never allow the study of the future to lose its freshness, vigor and flexibility - the hallmarks of its integrity.

If such a program is implemented, it must remain small, independent of any specific discipline or department, and act as a catalyst to infuse all aspects of the curriculum with futuristic perspective (1975:197).

An alternative, justified by economic and other institutional variables, would be to "futurize" existing courses, regardless of the discipline. This approach would be better suited to colleges and universities. Some existing courses in education, genetics, population, family, alternative lifestyles...are naturals. This is not meant to be an imposition on faculty members who are professionals within their discipline, or a rigid, prescriptive dictate on how to futurize their courses. Some courses will lend themselves to a pervasive futuristic slant from beginning to end. In other courses, some faculty might devote two or three weeks at the end of the course to consider recent developments and their potential physical, ethical, legal, economic or political implications for society. This latter approach, although less costly, would necessitate intense cross-disciplinary communication among the faculty so that the students, deprived of a cohesive futures base, could nevertheless integrate in a meaningful manner, their highly multidisciplinary experience and become self directed learners.

II. THE SYSTEMIC ORIENTATION

Yet, futurizing the curriculum is not enough. Our Western culture, based on a materialistic model of the world, has relied heavily on the scientific-analytic method which has served us very well in the areas of science (pure and applied), and particularly in the wondrous creations of technology. However, its failure has been precisely in the areas having to do with human beings. We have much to learn from the Eastern culture, whose con-

ception of the world as a living evolutionary process is different from ours, and essentially holistic.

As Edward T. Clark points out, "Historically, the primary starting point for structuring knowledge in Western thought has been to begin with the smallest self-evident part and proceed from these parts to incrementally build the whole. This approach is based on the Cartesian assumption that the whole can be predicated and thus extrapolated from its parts" (1979:1).

The result of the method is all too obvious in higher education. In the sciences, the Cartesian approach, most influential in the rise of Modern Western science, led to the sharp, unequivocal distinction between the mind (soul substance) and the natural world (physical substance), and was responsible for the enormous successes of physical science from Newton onward. Yet, at the same time, all those aspects of human experience which did not fit into the mechanical picture were set aside as non-empirical, non-scientific or just not fit for genuine scientific study. Consequently, the tendency of the scientific worldview is to exclude all consideration of mankind's traditional spiritual and psychic notions. It is sad to conclude that the nature of scientific education is such that there seems to be a direct correlation between success in science courses and lack of awareness of wider human issues (Wren-Lewis, 1974:159).

In the Humanities, traditionally dedicated to the notion of the whole man, the same splintering has occured. It is ironic that even though they feel separated from their scientific counterparts, as is illustrated by C. P. Snow's concept of the "two cultures", the humanists, impressed by the little understood scientific method, have adopted the reductionist approach so ill-suited to their subject matter. Too often, as Nell Eurich points out (1974:146), "Education in the humanities has been reduced to dry dissections of "great" works and men of the past whose very greatness is frequently submerged in footnotes." For the sake of "managing" the constantly mounting mass of material, time has been conveniently divided into eras, periods and centuries. Those digestible slices are thus compartmentalized and neatly labelled (e.g. the 17th century, the Age of Reason; the 18th century, the Age of Enlightenment) and become the focus for areas of specialization which constitute the process of scholarship and advanced training and provide the chance for accuracy and the comfort of self-confidence (1974:149). In this particular case, students limited to the study of a very precise slice of history, fail to perceive the role of precursors and forerunners as well as to realize that some writers still tend to exhibit "Romantic" traits, long after the official "Romantic Period" is over.

Finally, not only have the humanists become "idolaters of the past" focusing on some "giant thinkers" whose works are dissected ad nauseam (1974:148), but they provide very scanty references to the broader context. Can we really understand anything about Shakespeare's works unless we are infused with the understanding of the political, social, philosophical, aesthetic and economic background of the period? Deprived of an understanding of the spiraling process of the flow of ideas and of the meaning inherent in a broader context, the students are left to their own devices to integrate the disparate bits and pieces they have collected all along: a far cry from the concept of the well-rounded man. In this instance the whole is not even extrapolated from the sum of its parts!

As for the Social Sciences, a field less burdened by the load of past knowledge since their subjects only appeared as fields of study in the late 19th or early 20th century, they have taken as their primary orientation, present-day contemporary civilization. Their concerns focus on the immediate issues and the problem-centered studies of man and society (1974:146). There again the approach is analytic. Unfortunately, so busy are they to ape their "hard science" counterparts in order to give solidity and prestige to their discipline, that they get entrapped in the morass of meaningless data, methodologies and measurements, losing touch with the ineffable qualities of man and carefully avoiding the "non-scientific" issues or values as is aptly summarized by Heilbroner:

> "The problem caused by the intrusion of subjective values into its inquiries has always troubled social science, which has struggled, without too much success, to attain the presumed "value-free" objectivity of the natural sciences. Alas, this ambition fails to take into account that the position of the social investigator differs sharply from that of the observer of the natural world. The latter may stake his reputation as he regards the stars through his telescope or the cells through his microscope, but he is not himself morally embedded in the field he scrutinizes. By contrast, the social investigator is inextricably bound up with the objects of his scrutiny, as a member of a group, a class, a society, a nation, bringing with him feelings

of animus or defensiveness to the phenomena he observes. In a word, his position in society - not only his material position but his moral position - is implicated in and often jeopardized by the act of investigation, and it is not surprising, therefore, that we find behind the great bulk of social science arguments that serve to justify the existential position of the social scientist" (Heilbroner, 1974:23).

Since our educational system has favored in a disproportionate manner the analytic over the synthetic, the rational over the intuitive, we would like to suggest that a more systemic education, based on the interaction between both of these uniquely human endowments, would contribute to the curing of our educational malaise. The key to a systemic education is not so much a matter of what we teach, but how we teach it.

As defined by Clark, the systemic approach "begins with the whole in order to provide a context within which the parts, as they are learned, can be understood in a different perspective, that is in relation to each other and to the whole " (Clark, 1979:1).

For a more concrete application of this principle, we now turn to French author de Rosnay who, in his book Le Macroscope (1975), establishes some guidelines for a new systemic education:

1) Avoid the traditional linear or sequential approach and favor one which consists of coming back many times, but at different levels, over the material which must be understood and assimilated. The material is thus covered in successive touches following the pattern of a spiral: first the subject is seen as a whole in order to delineate its boundaries, evaluate its complexity..., then it is reconsidered later in a more detailed fashion (1975:266).

This approach for example would proscribe the "chapter by chapter" method of teaching too common in our schools. Only when the work under study has been read, discussed and evaluated in toto, should the slow, analytical process start. It is only when we see the total picture of the proverbial jig-saw puzzle, that we can appreciate its discrete components and their interrelations. In addition, we might well want to teach our students some helpful "tricks of the trade" (which they are left to discover slowly and painfully) such as the importance of the preface, the introduction, the conclusion and particularly the table of contents where, in one glance, one can catch the subject matter of the book, its subsystems and how they interrelate.

2) Avoid definitions which are so precise that they either polarize us or limit the play of imagination. A concept or a new law must be studied from different angles and integrated into different contexts. This avoids the mechanical application of any definition (1975:266).

For example, the concept of "progress" should not be reduced to the standard mechanistic definition of "more and bigger". It should be examined in an historical perspective, its development traced through the periods of industrialization and new technological discoveries to our present time where the global context, especially that of the environmental and natural resources, demands new definitions and a mapping out of alternatives. Can we live better with "less"? What do we mean by "the quality of life?" Such questions should be posed to our students and they, in turn, should be led to exercising their creative imaginations, so that they can come up with new, more realistic and more appropriate definitions.

3) Stress the importance of the concepts of limits, mutual causality, interdependence and dynamic equilibrium in the study of complex systems, taking as examples the disciplines which integrate the notions of time and irreversibility such as biology, ecology and economics (1975:266).

At the elementary level, the basic concepts of a systemic education can be pictorially described and the intellectual processes illustrated through examples chosen in everyday life. What better example than the thermostat to illustrate the concept of "negative feedback"? What are the animals which live in a symbiotic relationship besides the remora and the shark? What about the water-cycle on the Earth? Have we not been re-using the same water since the beginning of time!

4) Use a thematic approach at the vertical level which can integrate many disciplines and different levels of complexity around a central core (1975: 266).

For example, in the sciences the theme "the origins of life" involves astrophysics, physics, chemistry, geology, molecular biology and the theories of evolution and ecology. In the Humanities, the theme of "love", "death" or "childhood" could bring together works written by authors of many countries over centuries of time.

5) Never separate the knowledge of

facts from the understanding of the relations which link them (1975:266).

This principle is valid for all levels of the educational system and is an imperative if we want to guard the younger generations against the problem of the "environmental fallacy" defined by Churchman as "the lack of ability to think through the broadest implications of the particular action they are fighting for" (Churchman, 1979:4).

Finally, infused with the belief that we do and can contribute in many ways, we should allow for, and encourage, an intuitive, creative and non-rational approach to problem solving. A flash of insight can be as valid as a solution arrived at by the slow methodical analytical process.

III. THE GLOBAL ORIENTATION

Lastly but not least, keeping in mind the potentially grave dangers mentioned earlier, the increasing size of our global population and the information-communication explosion which cuts through the boundaries between the nation-states and tends to reduce the world to what McLuhan calls "the global village", we must foster in our younger generations an adequate international understanding and a genuine sense of belonging to the world community. The feeling of being a world citizen is a must for the five year old child today who can expect to live most of his adult life in the 21st century, and it is a must for the freshman entering college this year who will be a working member of society roughly from 1986 until the year 2026, and may remain a voting member of society some decades longer. For all of us, as well as for them as individuals, it is imperative that they be prepared to function adequately in an extremely heterogeneous world.

The first step toward this goal should be the re-instatement of foreign language study in our educational system, at all levels of the curriculum, starting with kindergarten when the child shows the greatest capacity to absorb a new language. Language cannot be separated from culture, and research has shown that bilingualism tends to lead to biculturalism. In turn, biculturalism helps the individual transcend the sense of unbridgeable alieness between races and cultures of radically different backgrounds because it alters profoundly his perception and his world view. The bicultural person, to use Thomas Wolfe's well-known phrase, "can't go home again." There is no turning back; home has taken a broader and larger meaning, it has been experienced and felt as such, and in the process has left an indelible mark on the individual who becomes more international and more pacifist. In this regards, Maruyama affirms:

> "The more languages the citizens learn to use, the more international-minded and pacifist the country tends to be. Switzerland is tri-lingual: French, German and Italian are official languages. It is a neutral country, and it acts as a peace broker when other nations are engaged in wars. Sweden, Denmark and Norway are not strictly neutral, but they played pacifist roles in cold wars and hosted refugees from other countries. An average high school student in Sweden learns Swedish, English, German and French, and often Danish and Norwegian. It is no wonder that Sweden produced Dag Hammarskjold, Gunnar Myrdal and Alfred Nobel" (Maruyama, 1979:312).

It is the monolingual attitude with its ethnocentric and parochial views, its arrogance based on ignorance and its fear of the unknown and the different, which presents the most dangers. In his concern for the student's preparation for life, one of Husen's conclusions had been that "the best vocational education is a solid, high quality general education" (Husen, 1979:160). Such an education must include the study of foreign languages.

The second step would be to infuse the curriculum with a comparative and a cross-cultural perspective so that "the child learns what he needs to know about his own country and culture, but perceives them as part of a broader human experience" (Reischauer, 1974:183). This approach does not necessarily mean adding new courses to the curriculum; but it requires "a profound change in the underlying assumptions of the curriculum planners, the textbook writers and the teachers" (1974:182). For example, students should be exposed to writings from authors who come from different countries and different cultures. Let's consider some nature poetry from Japan and India! How do these poems compare with those written by American poets? How similar are they? How different? What do they indicate about the life of these people and their values towards the land? What about the concept of justice in an Islamic country, contrasted with principles of the American Constitution?

We should never forget that we live in a world replete with information, that our children watch countless hours of television, and that documentaries such as those of Jacques Cousteau or programs such as Nova, Connections and others can provide us with a wealth of examples and

challenging questions.

Because the media play such an important part in our children's extra-curricular activities, they have a unique opportunity to use their tremendous power to make a lasting impact on their young viewers' developing world-consciousness by covering vividly and tastefully the numerous aspects of life in the non-Western world. In Reischauer's own words:

> "The child's appreciation of literature, art, music and dance might be greatly increased by widening the focus to all mankind and not limiting it to one cultural tradition.... Beethoven enriches the lives of the Japanese and Africans as well as Germans. The Pyramids, Greek sculpture, the Olmec art of ancient Mexico, the Buddhist and Hindu rock sculptures and architecture of India, the cathedral of Chartres, the medieval gardens of Japan, Renaissance painting, Persian miniatures and African wood carving are all part of a common heritage and should figure in education accordingly.... All human achievements should be regarded as the common legacy of all men" (1974:186).

CONCLUSION

What conclusions can we draw from this study? One of Husen's concerns had been that the school is "information rich" but "action poor" (Husen, 1979:133), and that "the emphasis on examinations tends to lead to the neglect of the less tangible objectives that do not lend themselves as easily to measurement such as initiative, perseverance, study skills, cooperative ability, ability to take responsibility and the like" (1979:147). If we look at the school in the light of General Systems Theory, we realize that the curriculum is a subsystem of the larger system. As is the case in Systems, all elements or subsystems are interconnected. By changing one key component of the system - the curriculum - we could, through a chain reaction, affect and change the whole. A curriculum based on the knowledge of the past, the awareness of the fast-changing present and the planning of alternative futures, enriched by a non-linear systemic approach to knowledge and infused with a cross-cultural and global consciousness, cannot but produce well-educated, well-adjusted, responsible and mature students who will display initiative, perseverance, cooperative ability.... They will become "those highly competent generalists", those "meritocrats of the 21st century" for whom Husen so urgently calls (1979:176).

There is no doubt that those self-directed, self-motivated students, schooled in critical questioning and constantly aware of the socio-historical and global contexts, will not easily fall prey to being the pawns of any capitalistic or other imperial bureaucracy as suggested by the Neo-Marxists. On the contrary, through the systems concept of the feedback loop, we can expect that these young men and women, able to hold conflicting world views simultaneously, and enriched thereby (Churchman, 1977:90), will move onward to the full unfolding of man's capacities for the building of a better world. With visions of unique and stirring vistas, they will design and re-design the school and the society around them, thus creating new challenges and new opportunities for the younger generations of their future.

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